

IT IS CLAIMED:

1. A process for fabricating a shaped article having a volume resistivity of less than  $10^{-2}$  ohm-cm, the process comprising:
  - combining an injection moldable aromatic thermoplastic liquid
  - 5 crystalline polymer resin and a composition comprising nickel-coated graphite fibers impregnated with a non-liquid-crystalline thermoplastic binder resin, to form a mixture at a temperature below the melting point of the thermoplastic liquid crystalline polymer resin, the graphite fibers being of a length of less than 2 cm and comprising about 5 to about 50% by weight of the mixture, and the
  - 10 binder resin comprising about 0.1 to about 20% by weight of the graphite;
    - feeding the mixture to an injection molding machine wherein the thermoplastic liquid crystalline polymer resin is melted and fed in the molten state to a mold;
    - cooling the mold to a temperature at which the thermoplastic liquid
    - 15 crystalline polymer in the mixture no longer flows; and,
    - removing the molded mixture from the mold.
  2. The process of Claim 1, wherein the nickel coated graphite fibers comprise about 10- about 40% by weight of the total composition.
  3. The process of Claim 1, wherein the nickel-coated graphite fibers are
  - 20 of a diameter in the range of about 5- about 15 micrometers.
  4. The process of Claim 1, wherein the nickel-coated graphite fibers have a nickel-coating representing about 45%- about 60% or a total weight of the nickel-coated graphite fibers.
  5. The process of Claim 1, wherein the aromatic thermoplastic liquid
  - 25 crystalline polymer is a polyester or a poly(ester-amide).
  6. The process of Claim 5, wherein at least 50% of the bonds to ester or amide groups are to carbon atoms which are part of aromatic rings.
  7. The process of Claim 6, wherein at least 75% of the bonds to ester or amide groups are to carbon atoms which are part of aromatic rings.
  - 30 8. The process of Claim 1, wherein the binder resin comprises about 5%- about 15% by weight of the graphite.
  9. A shaped article having a volume resistivity of less than  $10^{-2}$  ohm-cm comprising about 50- about 95% by weight of an thermoplastic aromatic liquid crystalline polymer and about 5% to about 50% by weight of a
  - 35 nickel- coated graphite fiber of a length less than 2 cm, and a non-liquid-crystalline thermoplastic resin at a concentration of about 0.1%- about 20% by weight with respect to the weight of the graphite.

13  
10. The shaped article of Claim 9, wherein the shaped article comprises about 10% to about 40% by weight of the nickel-coated graphite fiber.

14  
11. The shaped article of Claim 9, wherein the nickel-coated graphite fiber is of a diameter in the range of about 5 to about 15 micrometers.

5 12. The shaped article of Claim 9, wherein the nickel-coating represents about 45 to about 60% of the total weight of the nickel-coated graphite fiber.

13. The shaped article of Claim 9, wherein the aromatic thermoplastic liquid crystalline polymer is a polyester or a poly(ester-amide).

14. The shaped article of Claim 9, wherein at least 50% of the bonds to ester or amide groups are to carbon atoms that are part of aromatic rings.

15. The shaped article of Claim 14 wherein at least 75% of the bonds to ester or amide groups are to carbon atoms that are part of aromatic rings.

SUBP  
16. The shaped article of Claim 9, wherein the binder resin comprises about 5% to about 15% by weight of the graphite.

15 17. The shaped article of Claim 9, comprising a form of a bipolar plate.

18. The shaped article of Claim 17, wherein the bipolar plate has a thickness in the range of about 0.1 to about 10 mm.

19. The shaped article of Claim 18, wherein the bipolar plate thickness is in the range of about 1 to about 3 mm.

20 20. The shaped article of Claim 17, further comprising fluid distribution channels inscribed upon the surface thereof.

21. A process for fabricating an electrically conductive shaped article, the process comprising:

25 combining an injection moldable aromatic thermoplastic liquid crystalline polymer resin in the form of particles characterized by a mean particle size of less than 1500 micrometers with a graphite filler to form a mixture at a temperature below the melting point of the thermoplastic liquid crystalline polymer resin, the graphite filler being present in a concentration of about 5% to about 80% by weight of the total mixture;

30 feeding the mixture to an injection molding machine wherein the aromatic thermoplastic liquid crystalline polymer resin is melted and fed in the molten state to a mold;

cooling the mold to a temperature at which the resin in the mixture no longer flows; and,

35 removing said molded mixture from the mold.

22. The process of Claim 21, wherein the thermoplastic liquid crystalline polymer resin particles are characterized by a mean particle size of less than 1000 micrometers.

23. The process of Claim 21, wherein the graphite filler comprises a graphite fiber.
24. The process of Claim 23, wherein the graphite filler comprises a fiber of a length less than 2 cm.
25. The process of Claim 23, wherein the graphite fiber further comprises a metal coating.
26. The process of Claim 25, wherein the metal coating is a nickel coating.
27. The process of Claim 26, wherein the nickel coated graphite fiber comprises about 10% to about 40% by weight of the total composition.
28. The process of Claim 26 wherein the nickel-coated graphite fiber are of a diameter in the range of 5 to 15 micrometers.
29. The process of Claim 26, wherein the nickel-coating represents about 45% to about 60% of the total weight of the nickel-coated graphite fiber.
30. The process of Claim 21, wherein the aromatic thermoplastic liquid crystalline polymer is a polyester or a poly(ester-amide).
31. The process of Claim 30, wherein at least 50% of the bonds to ester or amide groups are to carbon atoms which are part of aromatic rings.
32. The process of Claim 31, wherein at least 75% of the bonds to ester or amide groups are to carbon atoms which are part of aromatic rings.
33. The process of Claim 26, wherein the nickel-coated graphite fiber further comprises a non-liquid-crystalline thermoplastic binder resin.
34. The process of Claim 33, wherein the binder resin comprises about 0.1% to 20% by weight of the graphite.
35. The process of Claim 34, wherein the binder resin comprises about 5% to about 15% by weight of the graphite.
36. A shaped article formed according to the process of Claim 1.
37. A shaped article formed according to the process of Claim 21.
38. The shaped article of Claim 36 comprising a form of a bipolar plate.
39. The shaped article of Claim 37 comprising a form of a bipolar plate.
40. The shaped article of Claim 36 further comprising fluid distribution channels inscribed upon the surface thereof.
41. The shaped article of Claim 37 further comprising fluid distribution channels inscribed upon the surface thereof.